

Communities, Action and Inter--action: A framework for mediated communication exploring service delivery and planning of community care services

Kristine Deray¹: Simeon Simoff²: Zoe Petridis³

¹University of Technology, Sydney. ²University of Western Sydney, ³Human Services Network (HSNet)

This chapter outlines the conceptual framework, methodology and initial interpretations of a pilot study undertaken by a governmental human service network, HSNet. The study, conducted in a rural community in NSW, Australia, approaches the communication between the service delivery and consumer as a dialogue. A dialogue between two parties can be positioned to trace and reflect on (1) the governmental planning model of service delivery and (2) the community that experience these services as individuals. Such experiential knowledge can be gained from understandings from a range of client stories that reflect the community interaction with service delivery. We approach the communication between parties as a transcript of differing parts that can actively construct relations through the mediation of the human services network, HSNet. Further dialog can be modeled on three levels: content, structure and presence. Each or all of these levels can be directed to supporting or nullifying *common ground* between parties. Here common ground refers to the knowledge shared by two communicating parties. The design problem focuses on how to increase the bandwidth for such interactions so that all parties can derive meaning. The long term goal is to position the health service network in a role where such mediation between parties can (1) be explicitly and implicitly linked to action that affects service planning and community delivery, and (2) that the experience of the individual in the community can be incorporated actively into the process of such planning. The chapter concludes with summary of preliminary insights from the project and a brief overview of future developments.

Keywords: e-health, communication, interactions, digital story telling interaction design

INTRODUCTION

The trend towards greater inclusion of clients/ consumers in their community/health needs, require information and communication technologies that supports a broader reality encompassing history and socio-cultural factors, and interactions between the involved parties (Haux, *et. al.*, 2002). Current approaches to community care service planning and the information technology tools for accessing planning do not focus on interactions between concerned parties and the implicit knowledge, embedded in such interaction. The focus of such systems has traditionally been to support the human service network by providing client data to assist in population based planning models of services delivery. Such models limit the presence of the individual and the features of the community. One of the issues that needs addressing for different ways of interacting with clients/consumers to evolve is an *understanding* of how such systems can be best placed to interact with the context they reference. Characterising this understanding so that it can be translated into the design and architecture of community care systems raises issues related to representation of communities and the individual client. A more participative approach between all parties concerned can only be supported and deployed in community care information systems when the client's and/or community's "presence" is incorporated into the dialogue between stakeholders more actively. Then the question is how to represent such "presence" in population based planning models. Changing attitudes to the design and deployment of health systems with more participative approach are, however, emerging (Haux, 2006; Benjamin, 2006).

As we shift the *focus* of the operation of health systems via Web services on the Internet, where computer--mediated interaction can foster a more participative networked structure to service delivery and planning for community health, we argue that electronic transactions can accommodate "presence" of the client /community.

Williamson, (2006), notes how Internet connected ICT's, (Information Communication Technologies), offer opportunities for greater facilitation in key decision making processes by giving participants the means to "speak" their story. Communication between parties can be *shaped and enhanced* by strategic placement of such technologies.

In this chapter we review a framework for sourcing representations of interaction between communities and Human Services Network, (HSNet), with main accent on one of its facets - Aging/ Disability and health care. The notion is to source a suitable methodology for the design of an *interaction framework* as means to increase the "dialogue" between stakeholders. Central to the design and implementation of such an interaction framework is the representation of interactions between interested parties, which: (i) needs to be articulated by some methodology, and; (ii) can be placed to function as a communication channel to *facilitate* interactions between relevant parties. This chapter deals only with (i), considering the methodology to source representations of clients interactions with community health care in a rural region. It reports on a pilot study in a rural community in NSW, Australia where clients' views of their perception and use of community care services were collected through the technique of Digital Story Telling. The stories form the basis for "representations" of the community's experiential knowledge of community care services.

Further in the chapter we discuss the background to the project and the need for a dialogue between parties. Motivation for the choice of DST as a method to incorporate presence of the client /community into the planning narrative is given and the application of DST into the pilot study is described. Preliminary interpretations of the value of the method are given with examples and application suggested for future directions of the research.

CONTEXT AND DIGITAL STORY TELLING

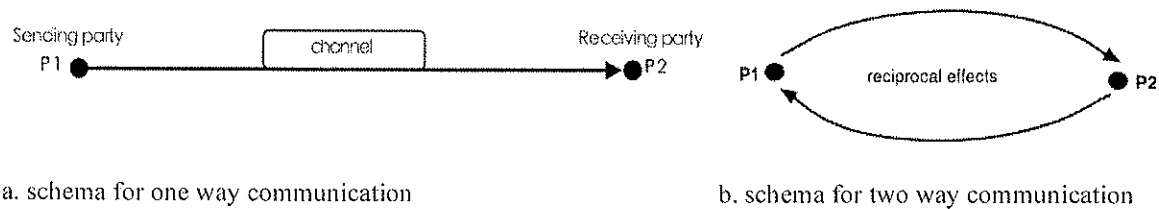
Real world communities show great diversity in composition with variables linked to demographic features, (age, special health needs, geographic location, cultural sensitivity, to name a few), so it is reasonable to infer a macro or unilateral approach of service planning and its delivery will not be flexible or extendable enough to cover all such variables. Much has been documented on the organizational level in relation to community care, but little exists on the client's side that tells their "story". In health generally some work has been done on participative decision-making (Reuthe and Allee (1999), discuss a team based approach to providing health care in a hospital). The emphasis in this project is how to go beyond the boundaries of the directives from the population planning, what we can refer to as the macro level, to incorporate the local or micro level expressed in the community.

Humans derive meaning from context and perceive relations between constructs by understanding the context such relations are embedded into. If dynamic processes are modifying the context as occurs in community service care, there is an argument for modelling this context. Moreover, the knowledge constructed through the "care" narrative is inseparable from social relationships and social experience of the parties involved in the interactions. There is a need to question how to design and implement more participative models of care services for communities. The interconnected nature of DST may provide the basis for suitable data structures of a more participative nature. The structure of data is an important factor in how it is understood and applied (Coeira, 2003).

THE INTERACTION FRAMEWORK FOR COMMUNITY ACTION: DIALOGUE

An interaction is a reciprocal action, establishing different relations between the interacting parties as a result of the way they behave to one another. Understanding these actions as relations requires some form of communication that can be observed and interpreted, as evidence of interaction is an observable effect. A simple example is the effect of providing a community car to a person recently discharged from hospital to assist with travel. The observable effect is that the person can be mobile and accessible. In any interaction there are two parties that require means to communicate with one another. In Figure 1(a) the communication is one way. A communication is sent via a communication channel from one party, P_1 to another party, P_2 who receives it. However we do not know how the "message" is interpreted. In Figure 1(b) communication is reciprocal. The receiving agent responds in some perceivable manner resulting in a two-way flow between parties. We consider such a schema the basis for how community care services can be represented so both parties in the transaction have a presence. The relevant parties in this chapter are the clients who reside in the community and the human service network. Such a schema we describe as a *dialogue*. It has no less than two nominated parties that enter into some type of communication. A party can be human or other conceptual entity, for instance, a process.

FIGURE 1. An interaction schema for participative planning



Significantly we consider the interaction schema shifts away from a concern with controlling the health service from a top down perspective to one where the focus is on the “space of interaction itself”. (Winograd, 1997, discusses a similar space of interaction enabled by the virtuality of the parties that jointly create it). In an interaction space the contribution of each party can be perceived making it possible to trace whom is being empowered in the dialogue. Community care programs do not automatically include the client’s perspective. As Kelly et al. (1993), question is it the community or the organizers themselves who are being empowered in community health programs.

APPLICATION: PILOT STUDY IN COMMUNITY CARE

The agency is an online health network, Health Services Network (HSNet) whose vision statement has the aim of “supporting service delivery to improve the well being of the people of NSW”. Health is one partner agency along with Ageing Disability and Home care, Housing Community Services, Corrective Services and so on. The HSNet web site is a secure online network for both government and non-government staff working in the NSW human services sector. (see the Human Services Network public Information web site, www.bsdp.hsnet.nsw.gov.au). The agency aims to grow functionality to incorporate human services staff in other Australian States and Territories. In their day-to-day work the web site has online resources that help agency staff. Such resources support sharing of information with other agencies. Facilitating service provision is partially defined as co-ordination between various health agencies to enhance interoperability and share information.

One of the objectives of the research is the perceived role of the health services network developing greater means of reflective representation. As an analogy we can compare the health agency to a communication channel whose resources add value to information transactions for all parties. The wider the bandwidth of such a channel, the greater opportunity for feedback mechanisms to be put into place if the mechanisms are suitable for the context.

The starting point for the project was a pilot study conducted in rural NSW, Australia, where a sample population of Home and Community Care Services (HACC) clients who made use of the services was taken. The Human Services Network administers HACC services. The project was conceived of as an initial “scoping” phase, placed as a necessary precursor to identify key views from the consumer perspective in relation to (i) the types of assistance provided by the service provider; (ii) the usage of such services; (iii) the possible “mismatches” to the community of such services; (iv) the ‘matches’ to the community of such services. We aimed to identify in such views if there are correlations between services on the ground and the expressed needs / requirements described in client stories and whether, or not, such stories can provide insight into the effectiveness of the community services administered by the local NGO. At present the feedback mechanisms from provider to human services network are in the form of four reports per year to the governmental planning agency. The reports cover the number of services offered and used by people who require assistance for special needs. Special needs may be temporary such as assistance at home after hospital discharge from, for instance, a fall, or service provision may be in the form of continuing assistance, such as community transport or domestic help for aging/disability clients. The main stream work in the report and its handling is targeting the aggregation of consumer encounter data at the point of care in order to deliver a complete, accurate, and timely view of consumer information. Such a perspective correlates with the schema in Figure 1(a) as the communication between NGO and human service network is designed to support representations of population based planning, rather than represent reciprocal effects of how such planning is received and understood in the community. (Figure 1(b)). The presence of the consumer is unrepresented, or underrepresented, and their experiential knowledge unheard. This is a fundamental problem of dealing with a complex dynamic context that reflects multiple views about that context from the different parties.

METHOD

The project takes a specific *technique*, “Digital Story Telling”, and places this as a “probe” to understand and describe what is relevant, or not, to client experience of existing community care services. The “stories” were gathered as digital audio recordings and subsequently analysed for common themes that relate to clients needs and perceptions. The aim was to ascertain *could* the technique assist in *conceptualising* the specific health and service needs for senior citizens in the community.

A lot has been written about story telling so our overview will be brief. The Victorian Government health promotion site gives an overview of the technique and its application in action research and notes that story telling has taken off around the world and not only in the domain of health. Further public sector agencies are now implementing new ways of information sharing as part of their business practices in order to realise the strategic value of knowledge management. This supports overall government objectives for integrated and more effective service delivery. (see Thomas (2001) as an example of IBM approach to knowledge management, Denning (2001), and Reilly *et al.*, (1998) for overviews of business practice that incorporates story telling). In health Greenhalgh and Collard, (2003), illustrate how using individual patients' stories can inform and help health care workers to understand and manage their patients' health profile more effectively. In places such as Africa story telling builds on the potential of oral traditions to communicate health knowledge (Silver, 2001). Essentially story telling infers a narrative. Narratives can be unstructured or structured, written or oral. Stories are inherently contextual, can be told *in situ* and can be managed and retained in relevant systems. Further the flexibility of digital technologies provides an effective medium for the documentation and dissemination of story telling. Multimedia “narratives” allow stories to be expressed/represented in a variety of ways (as Gobel *et al.* (2004), note storytelling can be deployed to support interaction between parties). Significantly interaction supports the emergence of common vocabularies, as stories can provide coordination across different communities of practice in organizations. Story telling may provide planners, service providers and clients with strategies to transform regions to increase effectiveness of service delivery on the ground by including the clients' voice (there are various approaches to widening the bandwidth for community informatics as Marshall, Taylor and Xinghuo (2004) have discussed). The inherent nature of story telling gives “permission” for communities and individuals within such communities to articulate different or differing perspectives to the unilateral population based one.

Consequently the technique “Digital Story Telling” has many interpretations and so it useful to define how this technique was used in the project. In the HSNet project the technique was formalised to provide an unstructured number of key questions that could be arranged in different order with varying duration to suit the particular client. This gave a balance between the flexible mode of delivery, and constraints imposed by the structure that provided commonality across the participants and allowed individual nuances to be articulated. All stories were digitally recorded and subsequently enhanced for web delivery. Further the project started with the expectation that, senior citizens would respond to the technique of “digital story telling” as means to identify specific concerns of the community in relation to the utilization and viability of HACC services. Secondly the technique could provide a “communication channel” for the community through which their “presence” could be traced. We assume that communities have, at least some, particular needs that are contextual.

SETTING BOUNDARIES FOR THE TECHNIQUE

The data gathered gives insights into what activities are working, could be provided to enhance delivery of HACC services, and identifies opportunities for improvement. Further some representation of the community emerges from the stories. It is not definitive; rather it is suggestive. The rest of the chapter covers the question structure, the themes embedded in the method and examples derived from the initial findings, in the context of how the technique can be placed as a tool to facilitate communication between clients, service providers and organizations.

DESIGN

The key research questions were linked closely to the designated areas of HACC. Seven themes were selected as representing key operational areas of HACC services for the elderly around which various questions were clustered. The themes were selected over a few meetings by representatives on the reference steering committee. Themes are referred to in the legend, Table 1 with base codes corresponding to the labels for each theme. Further Table 1 shows

which themes in the DST correlated to the relevant research questions. Graphically shading indicates correspondences between the unstructured questions in DST (here shown in Table 1 as questions 1, 2, 3) and the themes that emerged in the client stories.

Table 1. Key research questions linked to the designated themes that construct client stories

Research questions	Targeted Themes						
	Loc	Rout	Activ	Comm	Trans	Constra	Fut
1. Do the people in the community use HACC services and if so are some services of more use than others?	x	x	x		x		
2. Can the technique identify ways of improving service delivery in the community?		x	x	x	x	x	x
3. Can the technique reflect ways to improve the collection and use of data relating to HACC clients and service delivery?		x	x		x	x	x
4. Can the technique provide an insight into how to better include the views of HACC special needs groups into policy making in the community?			x	x	x	x	x
5. Can the technique identify innovative ways of improving community engagement, capacity mapping and some inference into the capability of a community to care for its members?	x		x	x			
Legend: Loc=location: Rout=routine: Activ=activities: Comm=community: Trans=transport: Constra=constraints:Fut=future							

A rural area was selected, the region of Nimbin NSW, as it provides (1) an area where two daycare centers are active that offer a rural service (2) it deals with service provision over large geographical boundaries, (3) supports a reasonably strong community. Participants were senior citizens with the average age being in the bracket of 70 to 80 years of age who did not suffer from any severe form of dementia (HACC clients are automatically screened for cognitive dysfunction).

Scope: The Interview questions

To give some idea of the composition of the themes Table 2 gives a breakdown of the questions for the themes of activities/enjoyment, community/social network. These questions were individually arranged driven very much from the perspective of the client. The questions followed an, “if—then”, logic resulting in a flexible structure that was authored individually and suitable to story telling. For instance, in the theme transport, the question is asked, “does someone else drive you”. If so then who: a family member, a carer? If a carer then where did you meet this person and so the story “unfolds”. Further the unstructured approach with open-ended questions provided means for the questions not to bias the respondent.

TABLE 2. Overview of Content of Three Subject Themes	
Subject	Content Questions
Activities- enjoyment	What do you like doing? / What leisure activities are you involved in? <i>and</i> What do you do to enjoy yourself? (<i>If they list external activities</i>) How did you get involved in that? / How did you find out about that?
Community-social network	Have you lived in Nimbin for a while? (<i>If yes</i>) Do you think Nimbin is a friendly place? Then you'd probably know a few people here? Do your family live nearby?

	How often do you see your family? How often do you see your friends? What kinds of things do you like doing with them when you see them?
--	--

INITIAL ANALYSIS

The pilot study provided twenty interviews of various lengths. Participants differed in their engagement. Some participants were happy to talk about and on most aspects of their lives; others were less forthcoming. Consequently the duration of “stories” varied, but none were over an hour. A higher percentage of females participated than males. All participants were ‘recruited’ through the community care centre(s) and the stories were collected in the same familiar surroundings.

The approach taken to analyzing the stories is based on “knowledge discovery” techniques where understanding is gained by the extraction of a high--level knowledge from a low level data, (see Simoff, Maher 2000, p125). We started by deriving text transcripts from the audio recordings that had been de-identified, providing a code for each participant. Initially no data cleaning was implemented. Content analysis to derive markers for the data segmentation based on the relevant question was first carried out. This proved problematic as the content of each individual story was often expressed in a meandering, circular manner that deviated significantly in places from the asked question(s). To address this we introduced three additional codes that are noted in Table 3.

Table 3. Additional Codes

Subject	Code
Other	Oth
Outside context	OC
Personal history	PH

A further consideration was the overlap between thematic areas and the corresponding questions. Often the questions naturally led into one another resulting in “fuzzy” boundaries between areas of concern. For instance, when telling the story of how they came to use community service transport, maybe the death of a spouse was mentioned, or a friend in the community who used to pick them up now no longer drives, or a recent medical incident and so on. The stories, in this sense, expressed the interconnectivity of the community, or the family and close friends / neighbors and the loneliness associated with aging. However it required a further refinement of the data to provide a deeper level of understanding. Adapting the methodology of Simoff, Maher (2000), we took the approach to segment the transcripts taken from the digital recordings into utterances. An utterance corresponds to a single activity of the service provider (transport, assistance, social interaction). This gave means to quantify the data by the total number of utterances, the number of utterances that start related to the same subject, and the duration allocated to each activity in the story. Table 4 presents an example of the steps in this segmentation. The subject activity is community /social network (coded as Comm). Utterances 3-7 however relate to personal history (PH) providing an inferred relation to why the client finds the community friendly. The numbering of utterances in the transcript in this way allows us to refer to a particular utterance or utterances and gives a method for comparison of the subject area based on the length of the question--discussion. The part of the methodology is based on a combination of methods following the Complementary Explorative Data Analysis. (CEDA) methodology as described in Sudweeks, Simoff, (1999). CEDA reconciles quantitative and qualitative principles. Iteratively CEDA allows for the use of experimental definitions verses operative ones. CEDA allows hypotheses to evolve and to change and to accommodate these changes consistently with earlier research findings. The main characteristics of the analysis are the focus on different frames of reference for each level derived from the stories of participants, the mixed use of quantitative and qualitative tools; and the final integration of results in a general framework.

Table 4. Steps in Segmentation of the Data

Client Code	Subject Activity	Line No:	Transcript as Recorded
CL_15	Comm	1	INT: Would you say it is a friendly place to live in?
		2	CL: Oh yes, yes, because we have always been here, this was, we had all our land here, all the hundred and twenty- five acres.
		8	C: Oh they are very friendly around here

	9	INT: In general the people are nice?
	10	CL: Yes, yes.
PH	3	INT: Yes.
	4	CL: and we just gave it away to the daughters
	5	INT: oh I see
	6	CL: yes that's how come they all come to have to have a piece each
	7	INT: Ok.

Our next step is to cross reference from one client story to another searching for patterns of commonality across particular questions, and/or patterns of divergence across participants. To assess the technique we need to be able to determine whether the technique can be placed to enhance “common ground” between stakeholders in a dialogue between community and service provider.

DISCUSSION

The experimental use of DST as a “probe” to construct client stories shows promise as means structure a “dialogue” on types of interactions that occur between service provider and client. By including the client’s view, encouraging them to be more proactive, a grassroots approach is taken. Recipients of the service are given a voice in the initiating and operational processes of the service. Of relevance here is Kelly, MacFarlane, Rodriguez, Fehir’s (1993) discussion on current operational strategies for community health care.

Initial responses were positive as most participants were empowered by the experience of telling their “stories”. Too often aging leads to isolation and consequent marginalizing of presence of such populations. Telling stories gave clients visibility, made them feel “counted”. Results, as noted, are preliminary and the scalability of the study needs extending, yet we can comment briefly on some interesting patterns emerging. We illustrate key themes emerging in the data through several examples taken from the client’s stories.

Social interaction, the lack of, increased isolation as aging proceeded, and transport were significant in identifying particular needs in the community and possible future directions for policy makers in community care. The patterns emerging are most noticeable when there is a match between the service theme and client need for such service. However the context of operation of a service is sometimes at variance with the identified community need. We note the following instances; (i) relevant to the theme “routine” (which looked at what kind of home help may be required) the texts revealed an attitude differing with the identified need. Consistent with that particular age demographic (70+ years) the attitude of “I can manage, I’m alright, don’t worry about me” was implied. Often a client would not ask for help, or not tell local medical members if they required assistance. This led to an under – statement of need for home care services leading to a further erosion of presence of these community members in the health service. Complexity is further added by the client’s attitude to lose of independence and impairment of life style. This attitude implicit in the interaction between the service provider and client suggests modification could be advantageous to how home cares services in the community are implemented and managed. There was a need for such service, but due to the “fit” not currently working with this generation of clients the need was understated. (ii) Transport is another complex issue. The distance covered by the rural health service compounds the operational capacity of this service. People on boundaries of policy planning regions tend to be disadvantaged by their peripheral geographical status. Such demographics impacted on the presence of these clients in service interaction. An instance- the current community bus requires a minimal number of people (12) to operate, a number often difficult to achieve. Consequently this service is underused although there is an expressed need for such a service. Currently there is one community car that only requires 3 passengers to run. It is used extensively. As with the home care services this service is valued, required yet the chosen vehicles are not matched successfully to the geographical profile of the region. The community car is predominantly used for medical appointments. Yet social isolation compounded by the large distances between clients in the region would be assisted by access to another small vehicle that could assist by taking clients on home visits and shopping. This would have the added benefit of combating social isolation. The specified transport *profile* set at the planning level is not appropriate for this particular community.

In terms of the operational context identified as the community we advance the notion of two foci: (i) is the provided service needed in the community?; (ii)- if the service meets a need in the community, does the operational strategy match the community profile as expressed in client’s stories? This gives us two views representing home care services: the macro planning view and the local view.

To increase *common ground* between parties, dialogue between parties require greater understanding of differing perspectives of parties and some mechanism(s) by which such views can be represented at the planning level. Based on preliminary insight from pilot study we are confident that DST can provide an insight into how to better include the "presence" of the HACC special needs groups (in this case senior clients) into policy-making as (i) DST can reflect the presence of the client's context through the content of their stories; (ii) DST can facilitate interaction between macro and local levels of health services by providing a communication mechanism for the dissemination of the client's context and their *changing* needs. Suitable data structure for the interaction under investigation requires representations that are dynamic and extensible to map emerging needs. We consider the interaction schema in Future 1(b) a data structure that could be modeled to support such features. The difficulty in such approach lies in (i) the ability to automate or semi-automate such processes; (ii) the difficulty for formalization of such "stories" loses the implicit knowledge of the client.

CONCLUSION

To expand the initial experimental study future projects need to include, (1) an inner city group of senior citizens to compare to the rural study, (2) a study of the stories of carers in the HACC services and (3) a study looking at the special needs of Aboriginal people. Since the profile of these groups varies we expect modification will occur in the employment of the technique of DST. We expect to visualize the derived representations from the data gathered in this pilot study in an online 3D world. Such an environment presents interesting possibilities for including the client's perspective that can be evaluated by hosting virtual communities composed of HSNet members to comment/discuss the findings. Only then can we approach the computational issues mentioned above.

ACKNOWLEDGEMENTS

The support of the University of Technology, Sydney and Department of Aging and Disability Home Care (DADHC) is gratefully acknowledged.

REFERENCES

- Benjamin, G. (2006). Putting the Public in Public Health, *Health Affairs*, 25, (4), 1040-1043
- Coiera, E. (2003). *Guide to Health Informatics*, Oxford, Oxford University Press.
- Denning, S. (2001). *The Springboard: How Storytelling Ignites Action in Knowledge Era Organizations*, Woburn, Mass. Butterworth-Heinemann
- Gobel, S. et al (eds). (2004). Technologies for Interactive Storytelling and Entertainment, Second International Conference, TDSE 2004, Darmstadt, Germany, June 24-26, *Proceedings, Lecture notes in Computer Science*, vol 3105.
- Greenhalgh, T. & Collard, A. (2003). *Narrative Based Health Care: Sharing Stories, a Multiprofessional Workbook*, Blackwell Publishing
- Haux, R. Ammenwerth, E. Herzog, W & Knaup, P.(2002) Health care in the information age. A prognosis for the year 2013, *International Journal of Medical Informatics*, 66, 3-21.
- Haux, R. (2006). Health information systems—past, present, future. *International Journal of Medical Informatics* 75, 268–81
- Human Services Network public information site. <http://www.bsdp.nsw.gov.au> Retrieved 10th July 2007.
- Keeble, L. & Loader, B. (2001) *Community Informatics: Shaping computer mediated social relations*. London, Routledge.
- Kelly, E., McFarlane, J. Rodriquez, R., & Fehir, J., (2003), Community health organising: whom are we empowering, *Journal of health care for the Poor and Underserved*, 4, (4), 358-62.
- Marshall, S. & Taylor, W. Xinghuo, Y. (Eds). (2004). *Using Community informatics to transform regions*, Hersley, PA, Idea
- Reilly, M. Matarazzo, T & Ives, W. (Dec 1998), Once Upon a Corporate Time. The role of stories in organizational learning, *Knowledge Management I*
- Reuthe, E. & Allee, V. (1999). Knowledge Management: Moving the care model from a snapshot to a story, *Health Forum Journal*, 42, (3), 26-28.

- Silver, D. (2001). Songs and Storytelling: Bringing Health Messages to Life in Uganda, *Education for Health*, 14, (1), 51-60
- Simoff, S & Maher, M.L. (2000). Analysing participation in collaborative design environments, *Design Studies*, 21, (2), 119-144
- Sudweeks, F. & Simoff, S. J. (1999). Complementary explorative data analysis: The reconciliation of quantitative and qualitative principles, in Jones, S. (ed.), *Doing Internet Research*, Sage Publications, pp. 29-55.
- Thomas, J. Kellogg, W & Erickson, T. (2001) The knowledge management puzzle: Human and social factors in knowledge management, *IBM Systems Journal*, 40,(4), 863-884
- Victorian Government Health Information. *Evaluation and dissemination*. Retrieved 1 July 2007 from http://www.health.vic.gov.au/healthpromotion/hp_practice/eval_dissem.htm
- Williamson, A. (2006). *Disruptive spaces and transformative praxis: Reclaiming community voices through electronic democracy*, Paper presented at the Community Informatics Research Network Conference, Prato, Italy.
- Winograd, T. (1997). The design of interaction, in Denning P., Metcalfe, R. (eds), *Beyond Calculation: The Next Fifty Years*, New York, Springer-Verlag

Communities in Action:
Papers in Community Informatics

Edited by

Larry Stillman, Graeme Johanson
and Rebecca French

**CAMBRIDGE
SCHOLARS**
.....
P U B L I S H I N G

Communities in Action: Papers in Community Informatics,
Edited by Larry Stillman, Graeme Johanson and Rebecca French

This book first published 2009

Cambridge Scholars Publishing

12 Back Chapman Street, Newcastle upon Tyne, NE6 2XX, UK

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

Copyright © 2009 by Larry Stillman, Graeme Johanson and Rebecca French and contributors

All rights for this book reserved. No part of this book may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the copyright owner.

ISBN (10): 1-4438-0959-4, ISBN (13): 978-1-4438-0959-7